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C09–AEI–406

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BOARD DIPLOMA EXAMINATION, (C–09)

MARCH/APRIL—2013

DAEIE—FOURTH SEMESTER EXAMINATION

PROCESS CONTROL

Time : 3 hours] [*Total Marks* : 80

PART—A 3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Draw the block diagram of a process control loop.

2. Define the control lag and cycling.

3. Define the actuator.

4. Define integral control mode.

5. List the different types of plugs.

6. Explain the ratio control.

7. List the applications of adaptive control system.

8. Distinguish between feedback and feed forward control system.

9. List the uses of P and I diagram.

10. Draw the P and I diagrams of the following transducers :

(a) Orifice plate

(b) Rotameter

(c) Nozzle

PART—B 10×5=50

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. *(a)* Define the controlled variable and manipulated variable and list its examples. 5

(b) Explain the development of automatic process control with example. 5

12. Draw the proportional, integral, derivative control modes using op-amps and explain it.

13. *(a)* Explain the tuning of PID controller with process reaction curve. 6

(b) List the advantages and disadvantages of proportional controller. 4

14. *(a)* Describe the derivative control mode. 4

(b) Explain two position and multiposition control modes. 6

15. *(a)* Explain the principle of operation of pneumatic actuator. 5

(b) Explain the principle of operation of hydraulic actuator. 5

16. *(a)* Explain the contstructional details of control valves. 5

(b) Explain the principle of operation of rotating plug control valve. 5

17. *(a)* Draw and explain the feed forward control system. 6

(b) List the applications of cascade control system. 4

18. *(a)* Explain the standards of ISA and ANSI. 6

(b) Draw the following process line diagrams : 4

(i) Capillary line

(ii) Electric signal

(iii) Hydraulic line

(iv) Pneumatic line

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